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ABSTRACT

Since 1906, hundreds of thousands of Alberta, Canada secondary school students have taken some form of provincially set and scored examinations. The grade levels of students required to write such examinations have changed several times, and tests have involved formats which included various combinations of essay, short answer, matching, and multiple choice. This booklet outlines the development, nature, purposes, and intended uses of the provincial testing system. The research and data collection services provided by the Student Evaluation and Data Processing Branch of The Alberta Department of Education are also reviewed. (Author/DSE)

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ROLES IN STUDENT EVALUATION AND RESEARCH

A HISTORICAL AND CURRENT REVIEW OF EXAMINATION PRACTICES AND FILES OF SCHOOL STATISTICS

Alberta
EDUCATION
September 1976

ROLES IN STUDENT EVALUATION AND RESEARCH
STUDENT EVALUATION AND DATA PROCESSING BRANCH
ALBERTA EDUCATION

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This chronicle has been produced by the Communications Branch from information supplied by the Student Evaluation and Data Processing Branch.

In order to provide consistency in reporting the flow of events in examinations practices some inferences were drawn. These should not be interpreted as necessarily reflecting current policy nor predicting future directions.

Appreciation is extended to a number of persons who provided useful and informative comments and suggestions. The Communications Branch accepts the responsibility for accepting some and not incorporating others.

Particular appreciation is extended to Mrs. Stephanie Senger for her patience and dedication in typing many revisions to the manuscript.

Summer, 1976.

I. INTRODUCTION

Since 1906, the year after Alberta became a province, hundreds of thousands of Alberta secondary students have taken some form of provincially set and scored examinations. The grade levels of students required to write such examinations have changed several times, and the tests have involved many formats including various combinations of essay, short answer, matching, and multiple-choice items.

Broadly speaking, four major purposes have been served by provincial examinations:

- provide a basis for award of a diploma;
- provide a screening device for admission to post-secondary educational institutions;
- provide evidence of changes in school programs;
- provide direction for curriculum review and change.

One of the most common misuses has been to equate teaching performance with student scores without consideration of other factors such as social experience, aspiration, etc..

This booklet outlines the development, nature, purposes, and intended uses of the provincial testing system. The research and data collection services provided by the Student Evaluation and Data Processing (SEDP) Branch of Alberta Education are also reviewed. The confidential status of individual pupil marks is re-emphasized.

II. PAST INVOLVEMENT OF ALBERTA EDUCATION IN PROVINCIAL EXAMINATIONS

Early Period

From 1906 through 1911 Alberta did not organize schools according to a Grades 1 through 12 system. Instead the province used the English standards system wherein Standard V constituted the end of formal education for most students, approximating our current Grade 8 level. Standard VIII provided the equivalent of Grade 12 or perhaps Grade 13 education. Examinations in the compulsory academic subjects were administered at the end of Standard V through the provincially developed and scored "Public School Leaving Examination". Successful completion was presumed to reflect the achievement of a fairly thorough basic education, and permitted interested students to continue into the higher standards. Similarly, diplomas attained upon completion of the examinations for Standards VI, VII and VIII provided entrance to different levels of normal school teacher education programs or to university. The Standard VII finals involved a possible total of 15 examination subjects in English, History, mathematics, sciences, and three second languages. However, students did not have to take all subjects; most students wrote an average of ten finals.

The province phased in the Grades 1 through 12 system in 1912 and 1913. Provincially developed and scored examinations were used in academic courses in Grades 8 through 12, with Grade 8 becoming the level for the Public School Leaving Examination. The newly established commercial, fine, and practical arts programs, were assessed by visiting provincial school inspectors rather than by provincial examination.

For a number of years the province awarded regular, technical, and commercial diplomas. Few schools offered the latter two types of programs, and these certificates were eventually abandoned. The employment climate and training requirements of the period allowed students to enter commercial and technical careers without high school graduation. Approximately one pupil in three remained in school past Grade 8,

and only one in fifteen reached Grade 12. Even fewer achieved matriculation standing. Moreover, many rural areas had no schools offering instruction beyond Grade 8. The agricultural character of the province and the rural location of many students meant entry to employment without a high school diploma.

In 1919 teacher recommendations for promotion and diplomas replaced Departmental examinations for Grade 9 students exhibiting outstanding achievement. Teacher recommendations expanded into Grades 8 and 10 the following year. In 1921 the province discontinued the Grade 9 examination and all promotions to high school depended upon recommendation from the teacher. In 1924, the province shifted to promotion by individual subjects in Grades 9 through 12 rather than by whole grade. The policy of Grade 9 examinations was reinstituted for all Grade 9 students, with Grade 10 following suit in 1925. Grades 8 and 9 and Grade 10 English examinations were supplanted by teacher recommendations in 1931. Grade 8 examinations have never been reinstated.

Changes in public and government attitude toward teacher responsibility for evaluating students seem to have been the basis of shifts in the evaluation system. Historically, marks of students have increased when teachers gained autonomy in marking practices. Concerned groups and individuals have often regarded this increase in marks as undesirable 'inflation', rather than a reflection of greater accuracy in reporting the results of local adaptations of provincial curricula. Periodic returns to a province-wide examination system have been used to block this perceived tendency toward inflation. It should be noted, however, that the formulae used for determining passing marks in Departmentals have varied over the years. From 1906 to 1923 a student required an "aggregate" grade score of 50% with no subject test mark below 34% to pass. Under the 'unit system' employed from 1924 through 1938, the student was required only to achieve the passing mark designated for each subject. A student's marks were no longer aggregated and averaged to determine a grade standing. In both the aggregate system of 1906-1923 and the unit system of 1924-1938 the student was required to obtain the minimum percentage designated as the passing mark in each subject. However, under the 1906-1923 aggregate system there were a number of instances where the percentages obtained by students as a group were arbitrarily adjusted by the examiners in order to compensate for particularly difficult examinations. Consequently, from earliest times, some attention was paid to the relative difficulty of tests as demonstrated by the relationship between the number of students taking the examination and the number scoring above a certain percentage. A higher 'passing' mark in a subject was required during the period 1924-1938 than in 1906-1923.

The Credit System: Curriculum and Examination Changes

Commencing in 1936-1937, the school program was divided into three main sections: Grades 1 through 6 were designated as elementary, Grades 7 through 9 became junior high, and Grades 10 through 12 became senior high grades. Diplomas were issued after completion of Grade 9 and Grade 12, with the junior high school diploma a prerequisite for entry into senior high school. Provincial Grade 9 tests were reinstituted and completion of Grade 9 became the termination point for basic education. The high school diploma along with completion of various and changing course prerequisites remained the key to

university entrance. During the 1937-1940 period Grade 10 and 11 provincial tests were dropped and the province phased in the high school credit system. After 1937 there were two critical points - Grades 9 and 12 - and mandatory Departmental final examinations were given to all students wishing to earn the respective diplomas. No Departmental examinations were given at any other grade levels.

From 1936 on, Grade 12 students' raw scores (the actual number of correct answers out of the total number of test questions on a course final) were scaled in order to provide a definite proportion of passes and failures; that is, the student's mark in each course depended upon the relative position of the student's score in comparison with the scores of all other students taking the same test. The scaling system was used for Grade 9 tests also, but at that level the student's scores on the separate examinations were aggregated and averaged to produce a passing or failing mark for the grade as a whole.

In the scaling process raw scores were distributed along the 'normal curve', with the tendency of examination and other scores to cluster around a central point and for fewer scores to be found at the extreme ends of the scale. The 'normal' base provided a predictable percentage of passes and failures. Throughout the 1906-1960s period, a consistent high school pass rate of from 80-85% of students taking the examinations existed. Under the previous aggregate and unit systems bonussing ensured maintenance of the pass rate, whereas the credit system reflected the distribution pattern of the normal curve.

Under the scaling system the provincial High School and Junior High School Examinations Boards predetermined the proportion of H, A, B, C, and D grades to be awarded. Students' raw scores were converted to scaled scores between 0 and 100 maintaining the relative position of each student's score along the scale. Letter grades were awarded according to slightly different formulae for Grade 9 than for Grade 12. (See Table 1).

It is important to note that scaled scores were merely an alternate means of reporting the predetermined rates for awarding letter grades. Scaled scores were not percentages even though the scores were often referred to as percentage marks, such as "85% in English 30". A scaled score of 85 was not an indication that 85% of the student's answers were correct or that the student obtained a raw score of 85 of x or that the student placed among the top 15% of candidates writing the examination. The 85 was merely an interpolated number between 80 and 100 within which range the top 5% of all raw scores had been placed. Students averaging 60 or higher were eligible to enter university. Scaling was a means of reporting results in numbers, not a means of determining a standard of achievement.

Use of the predetermined rate of passes corrected for variations in the level of difficulty of examinations each year. The assumption was that the general abilities and achievements of students writing the examinations would vary less than the difficulty of the tests developed by examiners each year. The distribution of student performance at the Grades 9 and 12 levels was prescribed as approximating that of the normal curve, with the exception that a larger number of scores were cast into the 'C' and 'D' ranges than in the 'H' and 'A' ranges at the Grade 12 level.

After 1937 the emphasis on general education rather than university preparation meant that the high

Table 1 - SCALING SYSTEM FOR GRADE 9 AND 12 MARKS

Grade 9			Grade 12		
Letter Grade *	Scaled Score Limits	% of Students Receiving Letter Grade	Letter Grade *	Scaled Score Limits	% of Students Receiving Letter Grade
H	80-100	Top 10%	H	80-100	Top 5%
A	65-79	Next 25%	A	65-79	Next 20%
B	50-64	Next 35%	B	50-64	Next 35%
C	40-49	Next 20%	C***	40-47**	Next 25%
D(Failure)	0-39	Last 10%	D(Failure)	0-37**	Last 15%

* In 1966 the letter grade system was changed to A, B, C, D, F but the percent of students receiving each grade was unaffected. After 1966, marks in Grade 12 examinations subjects were changed to scaled scores in multiples of 5.

** In Grade 12 examinations subjects scaled scores of 38, 39, 48, and 49 were not used, a practice which provided a more dramatic separation of passes and failures, and decreased the prospects of appeals.

*** Lowest passing grade for non-matriculation courses; matriculation courses required 'B' or better standing.

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schools offered broader programs which retained students who otherwise would have withdrawn. Reduced employment opportunities for the unskilled, and increased public expectations for school continuation were two of the main reasons for public interest in expanding high school programs beyond university preparation areas. The expansion required, however, that there be a separation between diploma and matriculation requirements. The province provided a diploma route offering less-academically-oriented courses and requiring a pass standard lower than that for matriculation. The description 'C student' came into vogue to identify the non-matriculation pattern. Before 1952 'C' students could not formally enrol in matriculation courses until a trial year was completed successfully.

Development and Administration

Throughout the 1940-1960 period there was little change in the structure of the examinations and the administrative authority which commissioned them. From 1916 to 1973 the High School and University Matriculation Examinations Board supervised the operation of the Grade 12 examination program and after 1936 the Junior High School Examinations Board performed a similar service for the Grade 9 tests. Over time these boards had a membership comprising Department of Education officials, university professors, superintendents, teachers, faculty of normal schools, trustees, and other lay representatives. Each board administered policies related to the examinations while the tests themselves were developed annually by committees of subject teachers,

professors, and Department officials. Teachers hired for the summer scored the examinations under Departmental supervision.

Over the years the subjects examined have varied but have always included English, mathematics, science, social studies, and second languages. The subject titles of examinations have remained much the same over more than sixty years. The content and format of the examinations, the methods for scoring them, the number of examination subjects required for matriculation or diploma purposes, the number of students writing the tests, and the number of writing times each year, have changed considerably. Changes in the 1960s included modifications in university entrance and diploma requirements, introduction of the practice of 'anchoring' test scores to measures of aptitude, and the use of multiple-choice tests for machine scoring and statistical analysis.

Graduation and Matriculation Requirements

In general, diploma and matriculation requirements remained stable throughout the 1940-1960 period. To pass Grade 9 a student had to receive a composite score enabling assignment of a letter grade of 'C'. The basic requirements for a high school diploma were an overall standing of 'C' or better in 100 credit units, plus three Grade 12 examination courses in which the lowest acceptable mark was a 'C'. Matriculation requirements were 'B' standing in six Grade 12 matriculation subjects plus an average score of 60 or higher in these subjects. A 'B' standing meant the student scored in the top 60% of all candidates writing the test, but the additional requirement of an average scaled score of 60 or over for all six subjects meant that only 37% of all candidates could qualify for university entrance.

The 1960s brought an expansion in the number of universities in Alberta. The various faculties and departments of the three universities sought to alter entrance requirements to suit their local concerns. Common matriculation requirements were reduced to five examination subjects, and later to four plus one non-examination subject. Individual faculties and departments required specified courses, so generalizations since the mid 60s are difficult. With the reduction of university entrance requirements in the 1960s, about two-thirds of the students seeking university entrance standing were successful on the first attempt.

In the early 1960s the federal government identified a critical need for more manpower in commercial and technical areas. The Federal-Provincial Technical and Vocational Assistance Act of 1963 affected both high school programs and the system of scaling departmental examination scores. Provision of funds for commercial and vocational education spurred establishment of specialized vocational high schools and large composite high schools offering general, academic, commercial, and vocational programs. The routing of Grade 9 graduates into the various programs produced more high school graduates. Diploma requirements were reduced from three specified Departmental examination subjects to only one - English. Many students selected optional non-matriculation courses as replacements for the formerly mandatory matriculation subjects. Early routing of students into specific programs declined within a few years as federal support expired, but opportunities for student choice of subjects remained. Moreover, the number of diploma and matriculation students continued to increase because of the combined effect of greater population and flexible requirements.

Anchoring

Roughly parallel with the change in high school diploma requirements, and partly as a result of them, the province in 1965 introduced the practice of 'anchoring' examination scores. Anchoring involves use of a general academic ability test to establish the pattern of examination scores in an individual subject.

Since all diploma students, including those seeking matriculation, were obligated to take the English examination, the population taking the test represented all levels of ability and achievement. In contrast, a much smaller proportion of students took courses such as trigonometry or physics. The students opting for such examinations tended to be considerably above average in their intellectual ability. They were already screened by 10 and 20 level prerequisite courses. To avoid the problem of failing too many good students through the 'normal' scaling technique, the School and College Ability Test (SCAT) was used as an anchor.

The SCAT is a general test of intellectual ability. The raw scores on a provincial examination were matched against the SCAT scores of students taking that examination. For example, if the SCAT scores of the students writing Latin 30 showed that 20% (instead of the normal 5%) fell in the 'A' range, then the raw scores of the Latin 30 examinations would be adjusted to allow 'A's to 20% of the students.

The SCAT was written by all Grade 12 students from 1965 through 1970, and each year provided the anchor for each departmental examination subject. In 1971 the six year average was applied to anchor examination scores, and serves even now as an anchor for the Departmental appeals examinations.

Multiple-Choice Tests

Some machine-scored multiple-choice tests were introduced satisfactorily in the 1950s and in the 1963-1964 school year the province moved entirely to machine-scored tests except for English. Previous tests using essay, short answer, outline, and fill-in items had caused problems of interpretation for both students and markers; multiple-choice tests appreciably reduced these difficulties through provision of relatively straightforward questions and sets of answers. The older forms of examination had presented an onerous problem of scoring during the summer holidays and issuing results within a reasonable time for diploma and matriculation purposes. The number of students taking Grade 9 and 12 examinations had increased from hundreds in the 1920s to tens of thousands in the 1960s. Machine-scored tests enormously reduced the time, the number of markers required for the scoring operation, and costs. Multiple-choice tests are the most easily adaptable of all types of tests to technical statistical procedures such as norming, inter-item analysis, and reliability checks.

Despite the advantages outlined, multiple-choice tests also presented some problems. A difficult one was creation of items which would test more than simple memory. Nor do such tests allow demonstration of student speaking, listening, and writing skills. However, as test developers grew more sophisticated, the scope of difficulties was reduced. For instance, keying the tests to Bloom's Taxonomy of Educational Objectives in the Cognitive Domain enabled testing of higher level intellectual skills such as judgment, interpretation, generalization,

and problem-solving. For English 30, essays were continued as part of the final examination, but a special marking key was developed to promote both consistency and comprehensiveness of marking techniques among the sub-examiners.

Despite improvements in test format, the notion that any provincially set and developed examination was useful and/or desirable, regardless of type of test and method of scoring, continued to be criticized.

Movement to Accreditation

Over the course of years many educators, students, parents, and others have protested the use of provincially developed, set, and scored examinations. This sentiment grew appreciably during the 1960s and 70s. Major arguments against the examinations included concerns about their restrictive effect on curricula, their inability to deal fairly with all parts of a course adapted for local needs, their misuse by some jurisdictions to judge teacher performance, and the inadequacy and psychological burden of a one-shot total and final evaluation. Increased qualifications and experience of the teaching force justified a shift to summary evaluations by the teachers. Proponents of retention of Departmental finals expressed concerns about loss of standards if individual teachers were allowed control of evaluation, held that teachers were more technically qualified to instruct than to evaluate, claimed that Departmental evaluations protected teachers from local pressures to pass undeserving students, and argued that provincial examinations provided a benchmark for year to year and locale to locale comparisons. Furthermore, there was evidence that an individual's examination scores were useful predictors of continued academic success. For example, a student who did very well on the Grade 9 examinations was likely to do well in high school, so could be advised accordingly regarding selection of high school courses. Many variations on the themes pro and con could be cited.

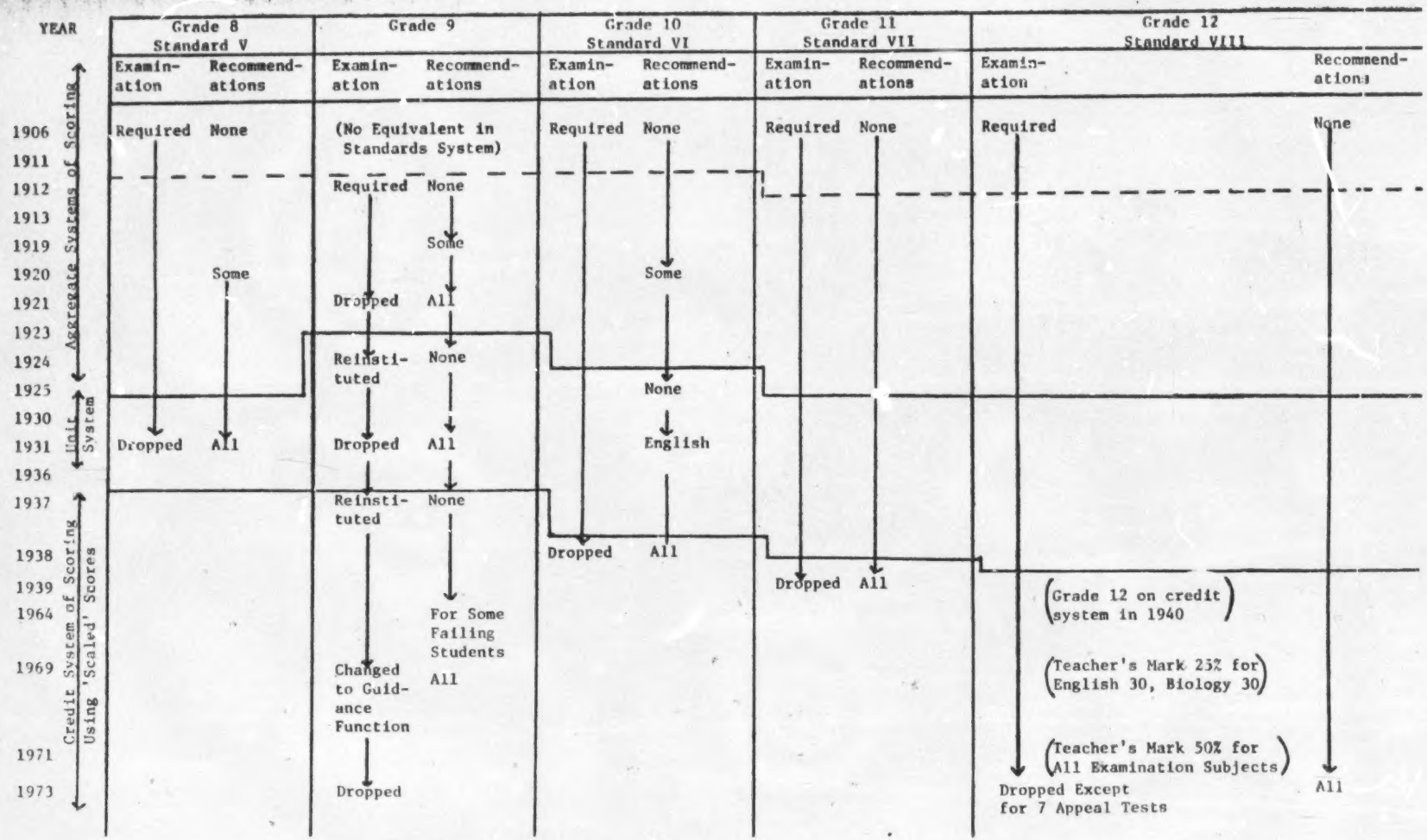
Although other factors influenced the decisions, plainly one reason the province periodically reintroduced Departmental examinations at the Grade 9 and 10 levels was concern that standards had in fact fallen after a period of exclusive use of teacher recommendations as the promotion system. But just as plainly the reinstatement of recommendations at later dates was due to confidence in teacher evaluation of students. As indicated in Table 2, during some periods of our history teachers could either recommend a student for promotion or require him to take a provincial examination. At some times examinations were mandatory for all students, and at others students had only teacher final evaluation with no appeal.

Under the 1963 Accredited School Districts Act school systems could apply for accreditation in all aspects of operation, including student evaluation. By the date of repeal of the act (1970) no boards had applied for accreditation - probably because the act contained a proviso that accredited school boards would have to be entirely self-financing.

In 1964 the province began to permit high school course enrolment for students who had failed Grade 9 but could get local school system permission to enrol in a special high school program. This change began a shift to use of Grade 9 examinations for guidance purposes.

In 1969 the province terminated use of the seven-part Grade 9 tests for promotion purposes. This action came partly in response to the growing resent-

TABLE 2 — HISTORICAL DEVELOPMENTS IN THE USE OF PROVINCIAL EXAMINATIONS IN ALBERTA 1906-75.



[This table is adapted and updated from Table 1 of "School Examination Practices and Standards in Alberta", by R. S. MacArthur and S. Hunka, a study commissioned by the Royal Commission on Education in Alberta, 1959.

Standards V and VI became Grades 8-10 in 1911; Standards VII and VIII were converted to Grades 11 and 12 the following year.

The unit system of scoring examinations was phased in over the 1924-26 period in the five grades affected.

The high school credit system was phased in over the 1937-40 period, but the credit 'scaling' (predetermined proportion of passes and failures) system of scoring examinations was fully in effect from 1936 on for Grades 9 through 12. Grade 8 examinations had already been dropped. For descriptions of the aggregate, unit and credit scaling systems, see text. The terminology is borrowed from MacArthur and Hunka.]

ment against provincial examinations, concern about unfairness of one-shot evaluations, increased confidence in teacher qualifications, and partly because of a change in thinking behind grade and course promotion policies. Instead, a Grade 9 Achievement Tests Battery based on general educational skills was developed to assist students, counsellors, administrators, and parents in selecting senior high school programs for the students. The Achievement Battery continued until 1973, when it was discontinued by Ministerial Order.

From time to time the High School and University Matriculation Examinations Board revised the number of subjects in which a provincial final examination was set. The number declined over the 1960s and 70s until in 1973 only eight subjects were left. The board was also instrumental in the movement to reduce the impact of the provincial Grade 12 examinations and even to terminate them. In 1969 the Minister approved a board recommendation to allow the teacher's evaluation to comprise 25% of the final mark in English 30 and Biology 30. Teacher marks were converted, scaled, and combined with the examination mark to provide a composite mark for the particular subject. By 1971 all examination subjects combined the teacher's mark with the June test mark on a 50/50 basis. By the 1970's the province had also permitted a few school jurisdictiors to conduct experimental programs involving curricular and timetable changes which by the nature of the program and scheduling exempted students from provincial examination. Hundreds of students in several schools in Lethbridge, Calgary, and Camrose obtained diplomas and matriculation standing through these special programs.

The province's Commission on Educational Planning added another voice to the call for accreditation when the 1972 report A Choice of Futures recommended termination of the Grade 12 examinations.

As the number of schools on split-year plans increased rapidly in the late 1960's, a major problem arose in trying to accommodate end of semester and trimester testing for many students in the mid-year periods of school operation. A question of credibility was generated when some teacher marks were sufficiently different from examination results to bias the final mark. Were the teachers deliberately biasing the final mark? Did the inadequacies of a one-shot machine-scored examination unfairly deflate real pupil achievement? These problems continued until February, 1973, when the Minister terminated the mandatory nature of Grade 12 examinations. School boards were invited to request complete accreditation retroactive to January, 1973. Systems which did not choose to request immediate accreditation were given a transitional year in which the Departmental examinations could still be used. However, in such cases the examination mark exclusively became the student's final mark.

In his announcement on accreditation the Minister cited a number of factors influencing his decision:

- the recommendations of the High School and University Matriculation Examinations Board, the Commission on Educational Planning, and the Alberta Teachers' Association;
- successful experience with the several previously accredited high schools, including acceptance of graduates by post-secondary educational institutions;
- the superiority of local teacher evaluations based on many tests and projects, as compared with the one-shot nature of provincial examina-

tions.

The Minister also guaranteed students an appeals procedure through provincial examinations, and indicated that the province would continue to assess both accreditation procedures and the methods used to measure school performance in maintaining standards. A collateral announcement to schools anticipated development of a "scheme for the systematic assessment of standards of achievement".

Few boards delayed the accreditation procedure, and all schools were accredited by the end of the 1973-74 school year. Provincial examinations remained as a route for appeals in seven subjects. These examinations and the High School Achievement Tests being developed in accordance with the Minister's mandate for an assessment scheme are discussed in Section III.

Present and Future

Alberta was the last province to drop mandatory senior high school provincial examinations. However, at the time of writing of this statement (summer, 1976), some provinces have reinstated examination requirements, and in Alberta the questions of return to Grade 12 'Departmentals', province-wide testing of basic skills, and shifts in achievement levels of students are receiving considerable attention.

The roles of classroom teachers in measuring student progress throughout the school term, and in interpreting scores on locally-developed, commercial, and provincial examinations have been paramount over the years. Teachers have had to be alert to reasons for discrepancies between expected and achieved results for students during the school term and at year end. Similarly, teachers have had to remain alert to discrepancies which are the result of influences from outside the school. Paper and pencil tests have not been sensitive to such influences.

There is no doubt that allegations of deterioration in student achievement and proposals for remedial action will recur. Appropriate roles for the teacher, the local school system, and the provincial government will continue to be developed and adjusted in the perpetual task of improving the school system.

III. CURRENT SEDP BRANCH ROLES IN STUDENT EVALUATION AND DATA COLLECTION

1. FORMS OF APPEAL OF SCHOOL MARKS AND CREDITS

Grade 12 Appeal Examinations

Since September 1973, standardized multiple-choice provincial Grade XII examinations are available in seven subjects normally used for matriculation (university entrance) purposes: Biology 30, Chemistry 30-30X, English 30, French 30, Mathematics 30, Physics 30, and Social Studies 30. The English 30 test includes an essay along with multiple-choice items. The tests are based on the mandatory portions of course outlines provided in the provincial Program of Studies. Emphasis is placed on the cognitive curricular objectives in the program, including both recall and interpretive items. The tests may be revised periodically as changes in the Program of Studies warrant.

Although popularly known as 'appeal' examinations, the tests serve more than an appeal function. Four distinct groups of students are eligible to write the Grade XII examinations:

1) Any student dissatisfied with the standing attributed by teachers for school study may write a Grade XII examination in an attempt to improve the mark.
2) Any student studying privately who is 18 years old or over and has been out of school for at least a year may write a Grade XII examination in order to obtain high school credit in a subject.
3) Any student who did not write a school examination or otherwise could not complete a course because of illness or other unforeseen circumstance may write the Grade XII examination upon approval of the school principal.
4) Any student may write the Grade XII examinations in order to apply for scholarships whose donors require Alberta Education examination marks.

Because the two largest groups of students writing the Appeal Examinations fall into categories 1 and 4 above, the spread or distribution of scores on the examinations tends to be bi-modal, i.e., the scores tend to cluster around two separate points. Generally, scholarship applicants score highly on the examinations, while students appealing teacher marks score close to, and often a little lower than, teacher marks.

Scaling techniques used in scoring the examinations relate closely to procedures used in anchoring the former Departmental examinations, although the distribution of scores usually is such that the scaling operates only as a check or comparison with the distribution of marks awarded by teachers. To date there has been only minor discrepancy between teacher awarded marks and Grade XII examination marks.

Recording and Transmitting of Results

Each student's marks on Grade XII examinations are recorded on the student's transcript, which is available to the student upon request. The student also receives a copy of the transcript along with the high school diploma awarded after the completion of diploma requirements. In addition, an individual results statement of the student's own Grade XII examination marks is mailed to each student taking one or more of the appeals tests. Each school receives a summary report of the results of all of its students who took the Grade 12 examinations. Any student who does not wish his results reported to the

school may send a written request to the SEDP Branch to delete his scores. This reporting arrangement satisfies provincial concerns regarding confidentiality of student marks. The latest mark achieved and the highest mark achieved previously by the student are the only marks appearing on the student's transcript for the particular course regardless of how many times the student may have been enrolled in a course or written an Appeal Examination.

Local Appeals

The grade 12 Provincial examination is not the only avenue of appeal open to students. Most, if not all boards, provide recourse to students and their parents to appeal a mark through local procedures. In some instances a local appeals committee is set up to hear cases. Such appeals can occur both in subjects for which there is no provincial examination and in the seven remaining subjects in which there is an Appeal Examination offered by Alberta Education.

Special Cases Appeal Committee

The province also maintains a Special Cases Committee which has a number of functions related to examinations, marks, and credits in high school subjects. The Special Cases Committee deals with all matters which require the interpretation and application of policy with respect to student programming. Such matters include:

- determining the number of high school credits to be awarded to students for study outside the province;
- ruling on whether or not students who have been expelled from school should be permitted to write Grade XII examinations;
- ruling on individual cases where a student's program may be unduly restricted because of Alberta Education regulations;
- determining 'mature student' status in individual cases;
- reviewing cases where failure to meet local attendance requirements appears to be the sole reason a student has not been recommended for credits;
- granting credits retroactively where a student has completed a higher level of a course without finishing the prerequisite course(s).

Any teacher, principal, or student who thinks an individual case requires special consideration beyond that given by the school or school board should apply in writing to the Secretary, Special Cases Committee, Alberta Education, Edmonton, Alberta.

2. GRADES 10, 11, 12 ACHIEVEMENT TESTS

At the time of the February 1973 announcement of discontinuation of mandatory Grade XII matriculation examinations, Alberta Education indicated the development of a "scheme for the systematic assessment of standards of achievement" in Alberta schools. Norms were to be established by means of a comprehensive testing program. These norms would provide a benchmark for future measures of achievement.

The tests being developed in accordance with the 1973 mandate are the High School Achievement Tests in English, French, social studies, mathematics, physics, chemistry and biology. As of January 1976, the last four named are available for local use. The social studies, French, and English tests are in various stages of development.

Chemistry, Mathematics, Physics, and Biology Tests

Each of the four currently available tests includes

sets of multiple-choice items sampling the range of each of three sequential high school levels of a course - 10, 20, and 30. Test items were built by committees of teachers under the supervision of Student Evaluation and Data Processing Branch staff. The items were analyzed by the committees and pretested for validity, reliability, power to discriminate, and range of difficulty appropriate to the three different course levels.

The tests are based on the curriculum objectives outlined for the mandatory components of subjects in the provincial Program of Studies. The Program of Studies outlines the required content, concept, and skills to be covered in a course.

The tests, emphasizing interpretation and application rather than particular content, are designed for use in situations where the stock of fact items in course content differs somewhat from class to class but the overall concepts and techniques studied are those in the Program of Studies for the specific course. For example, a Physics test question on electricity may require the student to apply Ohm's Law in a situation not previously used as an example or experiment in class. Since the physical law has broad applicability, the student's skill in applying the law in new situations is tested through the question.

Although the High School Achievement Tests have been constructed by teachers familiar with the objectives and content prescribed for a particular course, local teachers must judge the relevance of the achievement test items with respect to adaptations of course content to meet local needs.

Social Studies, French, and English Tests

Tests for high school social studies, French, and English 10, 20, and 30 are in various stages of development. The French and social studies tests are being developed through the services of many classroom teachers who attend test construction workshops in which each teacher builds several items. A Student Evaluation and Data Processing Branch test consultant is assigned to the teachers in each subject to conduct the workshops. For example, the social studies test has involved the contributions of test items and analyses from approximately 100 teachers. The items are discussed and the ones judged best are pretested for validity, reliability, and other important factors. Some of the items used may not be of the multiple-choice variety.

Classroom teachers are also acting as consultants for development of the English and French tests. Active participation in this type of test construction provides valuable skill upgrading for those teachers involved. They in turn can share their experience with other colleagues, thus improving the quality of local testing programs and teacher-made tests.

It is expected that a number of valid and reliable items not incorporated into the final forms of the tests will be available to teachers upon request for use in local testing programs.

Instructions for use and assistance in determining the validity of provincially developed items vis a vis locally applied curricula are offered by the Student Evaluation and Data Processing Branch.

Norming, Validity, and Reliability

The physics, biology, chemistry, and mathematics tests were normed in February 1975 through use of a province wide sample of 1500-3000 students for each test. The students were drawn randomly from schools in all areas of the province. However, some of the circumstances surrounding the norming operations were unfavourable. There were difficulties in drawing a sample after commencement of a new semester and the testing disrupted three school days. French, English, and social studies tests will be normed at different times of the year and with less disruption of school programs.

The norms for all tests will be checked and revised as curricular changes and other circumstances warrant.

Content validity of each test considers the match between the curriculum as offered locally, and the course objectives and content presented in the Program of Studies. Test reliability is calculated through use of the Kuder Richardson Formula 20. Reliability co-efficients have been calculated for each level of the test, to serve as measures of internal consistency -- the extent to which one form of a test matches other forms for the same subject.

Test Manuals

Instructional manuals are issued with the achievement tests. The manuals explain the structure and content of the particular test, the level of difficulty of individual test items, the relation of the items to the content of the 10, 20, 30 levels of the course, the type of thought process involved and the content area of each item. For example, the Physics manual identifies item 4 on the Physics test as a question on sound which requires both knowledge and comprehension, while item 20 on light requires observation and measuring.

The manual provides information on the statistical validity and reliability of the test, the proper uses of the examination, and the manner in which results are to be interpreted. Directions for administering the test are included along with an answer key for use if the teacher, school, or school system wishes to score the test locally. Several pages are devoted to interpretation of test scores at the 10, 20, and 30 levels. Raw scores in relation to percentile ranks, bands, and stanines are discussed, and the relative difficulty of each test item is presented. It is intended that the manuals be revised periodically to accommodate suggestions from users, and to report any change in norms occurring through establishment of new benchmarks.

Uses and Cautions Regarding the Achievement Tests

Alberta Education practice is to develop two parallel forms of the test for each subject tested. One form of each test is reserved for Alberta Education purposes, such as periodic reestablishment or re-evaluation of norms. The second form of each test is available free of charge from the Student Evaluation and Data Processing Branch upon request by school systems, schools, or individual teachers following the development of local policy on the use of the tests.

Good evaluation is a complex and many-faceted process. While the achievement tests can provide a benchmark for use by teachers, schools and school boards, they are not appropriate as the sole instrument for final evaluation of students and school programs. Based on the Program of Studies for each subject, the tests were designed and constructed by teachers as service in-

struments for optional use only. They do not represent prescriptive or restrictive devices on local adjustment of curriculum or any reinstatement of the discontinued Grade XII Departmental examinations.

Since the achievement scores of new users of the tests do not affect the established provincial norms, student results on the achievement tests are not collected by Alberta Education. The Student Evaluation and Data Processing (SEDP) Branch will establish procedures for renorming when necessary.

The tests may be hand-scored locally through use of the answer keys provided in the test manuals or may be forwarded to the SEDP Branch for machine scoring.

Regional data related to the 1975 established test norms for the physics, chemistry, mathematics, and biology examinations may be obtained from the Regional Office of Education serving the particular school system or from the SEDP Branch. Persons authorized to obtain copies of one or more of the tests and the appropriate manuals may place an order through the Director of the SEDP Branch, specifying the number of copies required. IBM 1230 mark sense sheets (General Purpose #1 Answer Sheets) can be purchased from the School Book Branch. Only originals, not photocopies, of this type of answer sheet can be processed by the Alberta Education pro-processing facilities.

All school superintendents have copies of the achievement tests and manuals, as do all Regional Offices of Alberta Education. Any educator interested in viewing these materials can survey them in the school board office or at the appropriate regional office.

3. SCHOOL, STUDENT, AND TEACHER RECORDS-COLLECTION AND RELEASE

The Student Evaluation and Data Processing Branch collects data for use by Alberta Education, other provincial government departments, Statistics Canada, the Alberta Teachers' Association, the Alberta School Trustees' Association, universities, and individuals.

While individuals have access to their own files, organizations such as those named above usually have access only to aggregated data covering whole groups not identifying individuals. The most important information gathered and stored by the Branch includes:

- characteristics of Alberta schools and school programs;
- records of student marks, credits, and diplomas;
- information on teachers' qualifications and experience.

Information on Schools

School Lists . . . The Student Evaluation and Data Processing (SEDP) Branch annually produces two lists of currently operating Alberta schools. The List of Operating Schools includes all public, separate, and approved private schools. Schools are listed by school system, providing each school's name, provincial computer code number, address, principal's name, grade levels, and number of teachers. The list is available from Alberta Education at a cost of $2. A list of approved secondary schools is available for $1.

Course Information . . . Through various records submitted on provincial forms or computer tape,

school boards provide the SEDP Branch with information on programs offered at the junior and senior high school levels, including courses, sections or classes, credit values, and enrolment. Qualifications of teachers offering senior high school courses are also listed by course. In the case of schools offering senior high school courses, the signature of the appropriate Regional Office Coordinator on the Secondary School Registration Form constitutes official recognition that the school is accredited to determine marks in all subjects, including those formerly requiring a provincially set Departmental examination. The marks are the basis for award of credits.

Student Achievement, Credits, and Diplomas

Student Records . . . The SEDP Branch maintains records on student achievement, including senior high school marks, credits earned, and attainment of a high school diploma. No records are maintained provincially for individual student achievement below the senior high school level. Schools do submit registration forms for Grade 9 students, but not marks, except for a notation of pass, failure or withdrawal. The Grade 9 forms provide the basis for opening a file and assigning an identification number for each student for use as the student moves through the senior high school grades. For each transfer student coming into the province, files commence as soon as the Branch receives notification from the school. The student's previous high school work is assessed for Grade 9 equivalency and high school credits. The school usually makes the assessment, but either the student or the school may request the Branch to review the case. When documents from outside of Canada are involved, the office of the Registrar for Alberta Education may be consulted. Schools also evaluate private out-of-school music programs for any student wishing high school credit. Several programs, operated under the auspices of the Western Board of Music, the Toronto Conservatory and Mount Royal College, are approved by the province for senior high school credit. However, only certain programs are acceptable and these are evaluated according to guidelines contained in the Junior-Senior High School Handbook issued by the province. Up to 15 high school credits may be awarded for private study of music.

Diplomas . . . The grades and credit value from all local evaluation of Alberta high school courses, out-of-province courses, and music study are listed on the student's transcript, which forms the permanent record of the student's senior high school work. A student completing 100 credits or more with marks of 40% ('D') or better and including successful completion of the language arts, social studies, mathematics, science, and physical education requirements is eligible for a high school diploma, which is issued with an accompanying transcript of marks. These credit and course requirements may also be completed through courses offered by the Alberta Correspondence School. In each case one credit indicates completion of approximately 25 hours of instruction.

A number of optional routes exist for mature students - those 19 or over who have been out of school more than eight months or who although 17 or 18 have been recommended by a principal for mature student status. The province's Special Cases Committee rules on disputed cases. Mature students enrolled in courses for high school credit are registered with the SEDP Branch and may earn credits through the following routes: courses offered in

any accredited school; courses offered through an accredited extension program; courses offered by the Alberta Correspondence School; an appeal examination conducted by Alberta Education, with or without formal course instruction (there are examinations available in seven 30-level courses).

A mature student need not take the usual prerequisite courses before enrolling in a higher level course, nor need the student take any course in a 10, 20, 30 level sequence such as English before writing the appeal examination for the 30-level course. Whatever route the mature student elects, a mark of 50% or higher is required for award of credits in the course itself and retroactively in the normal prerequisites. For example, a student could write English 30, receive a mark of 50%, and attain credit for English 10 and 20 as well. Mature students may be awarded a high school diploma when they meet the subject requirements (excluding physical education) and have 100 credits.

Adult High School Equivalency Diploma . . . Adults who have not finished high school may apply to the SEDP Branch for the Adult High School Equivalency Diploma. The Branch will evaluate the individual's documents and award credits for various aspects of study and experience. The requirements are:

(a) a minimum of 60 credits in a provincially approved program through classroom instruction or correspondence, including:
   - 5 credits in mathematics
   - 3 credits in science
   - 5 credits in English 30 or 33
   - 5 credits in one other Grade 12 course
   - at least 42 additional course credits.

(b) additional credits, which when added to those in (a) will total at least 100, from additional high school courses and/or:
   - up to 15 credits for age, according to the following scale:
     Age 21-24: 5 credits
     25-29: 10 credits
     30+ : 15 credits
   - up to 15 credits for approved adult education courses under agencies recognized by Alberta Advanced Education and Manpower (e.g., public colleges, institutes of technology, university extension divisions)
   - up to 5 credits for extensive travel
   - up to 5 credits for extensive reading or private study.

While the high school diploma and the Adult High School Equivalency Diploma do not automatically provide entrance to post-secondary educational institutions, apprenticeship programs, or jobs, admissions officers and prospective employers usually have given preference to diploma holders.

Marking Practices . . . The province does not regulate procedures for school marks but expects that grades be assigned on a fair and just basis. Schools are required, however, to report marks in percentages for inclusion on high school transcripts regardless of local procedures. The SEDP Branch accepts and records school marks but does not interpret these beyond the implication that a grade of 40% provides credits and a grade of 50% may be a prerequisite for credit in subsequent courses.

Some school systems and schools have established blanket policies for evaluation and marking of each

course. However, in the majority to schools, marks have different implications in different sections or classes of a course. These differences are usually the result of local variations in evaluation techniques and standards. For instance, a mark of 70 in English 20 does not necessarily mean the student placed in the 70th percentile of all students taking English 20 in the class, school or system, or that he accurately completed 70% of the work for the course. If a 30-level mark is the result of a provincial appeal examination, a grade of 70 is a converted score based on the relative standing of the student among all students taking the examination, as anchored to previously established norms. Even with these techniques, however, there is no direct indication of the level of skills and knowledge attained by the student beyond what was demonstrated through correct answers to the specific questions on the appeal examination.

Confidentiality . . . The only official transcript and record of an Alberta student's high school work is the transcript issued by Alberta Education and bearing its official seal.

Student transcripts are confidential records and are not open to anyone except the student, unless the student requests that the document be forwarded to a third party. The student receives a copy of the transcript when such a request is made, and also when he is issued a high school diploma. Other official copies of the transcript may be ordered by the student from the SEDP Branch.

The Branch does not provide historical records on students to school boards. Boards may retain local records of students' marks, but these records do not constitute official transcripts. Once a student has transferred to another school system, the student's cumulative records must be forwarded to the receiving board or delivered to the student upon the student's request (on parental request if the student is under 18) for transport to the receiving board. The student's former board may retain local marks statements but should not retain any other reports on a student.

Data from student transcripts may be aggregated by the Branch for various studies, but no student's individual records are identifiable through this process.

Teacher Information

Information on teacher salaries, qualifications, experience, assignments, and terminations is important to Alberta Education and other agencies involved in education. To meet the needs of these agencies, the SEDP Branch maintains a file on each Alberta teacher and produces or cooperates in the production of aggregated data on the teaching force.

There are three main avenues for gathering data on teachers: the Secondary School Registration Form; the Teacher Transfer, Termination, and Leave of Absence Form; and the Educational Staff Record Form. The first two do not provide data on all teachers, the last does.

The Secondary School Registration Form (Form 'A') filled out by each high school principal includes a section for listing the certification, degrees, and subjects taught for each teacher teaching a class in a junior or senior high school subject.

The Teacher Transfer, Termination, and Leave of Absence form is filled out by each teacher who is temporarily or permanently leaving a teaching position. The form provides data useful in forecasting the number of replacements needed for the

current teaching force, and also gives some indication of the major reasons that teachers seek transfers, leaves, or non-teaching jobs.

The main information-gathering device for teacher data is the Alberta Education Educational Staff Record, a computerized form sent to all staff in each school jurisdiction. This form replaced the older School Opening Form used until 1975. Except in the case of a teacher who has not taught in Alberta before, the teacher merely updates the information that is preprinted on the form. The information to be completed includes the school system and school, the name, address, sex, age, marital status, and citizenship of the teacher, the type of teaching experience and certification the teacher may have, the teacher's university training, subject majors, and degrees, the years of teaching experience, current designated position (e.g., principal, classroom teacher) and grades taught, number and size of classes, non-teaching duties, salary, and salary qualification level.

The information compiled has many uses, including projecting teacher shortages in specific subject fields, determining patterns of staff deployment, and discovering the frequency of training patterns for teachers. The data can, for instance, contrast the number of teachers with extensive social science backgrounds with the number of teachers actually employed to teach social studies. This sort of comparison can provide the basis for discussions among Alberta Education, the ATA, the ASTA, and the universities regarding teacher training patterns.

The depth of detail provided through the Educational Staff Record and the arrangements for accessibility of the information to educational agencies minimize duplication of data-gathering activities. However, release of the information contained on individual forms is subject to strict rules regarding confidentiality of personal data. Various agencies have different limitations placed on the accessibility of the data. Alberta Education has access to all the data and may release data for conduct of provincially approved research projects, but with no identification of individual teachers except for the purpose of drawing samples. Statistics Canada receives a tape containing all the data but reports and uses only summaries in which the anonymity of each individual is assured. School boards receive data only on their own staff. The Teachers' Retirement Fund receives information on the name, address, age, sex, marital status, and citizenship of each teacher. Universities, colleges, and the trustees' association receive aggregated statistical reports. The Alberta Teachers' Association receives similar reports and the name and address of each active teacher who is a member of the ATA. The ATA also receives all the additional information on each teacher provided the teacher has not written the SEDP Branch requesting that the additional information be withheld. The request must be filed with the Branch within two weeks of the deadline date listed on the Educational Staff Record. If so filed, the ATA receives only the name and address of the teacher.

The arrangements described regarding limited use of teacher data satisfy all provincial concerns about confidentiality and privacy of information on individuals.

Alberta Education has a general policy that the individual should be given the opportunity to be aware of all information items that Alberta Education maintains on file concerning the individual. In

keeping with this policy, the SEDP Branch has provisions for individuals to review, revise, and update their own particular files held by the Branch. Each person has the right to challenge the accuracy of the information the Branch holds on the individual. Revisions and updates are usually accomplished through different types of preprinted forms forwarded to the individual and returned to the Branch with the recommended changes. Student data is usually reviewed through student correction of results and validation statements used for reporting and recording marks and credits. The sources of information on teachers are the Educational Staff Record and the Teacher Transfer, Termination, and Leave of Absence Form, both of which are examined by the individual teacher as to accuracy. Alberta Education holds no other personal and professional data on individual teachers except for copies of teaching certificates.

4. RESEARCH AND TEST PROCESSING SERVICES AVAILABLE TO SCHOOLS, SCHOOL SYSTEMS, TEACHERS, AND RESEARCHERS

The Student Evaluation and Data Processing Branch performs scoring and analysis for school testing projects and research on a request basis as resources and time permit. Because the services will be described in detail in the publication "Services for Scoring and Analysis of School Testing Projects" (to be published in September 1976), only a very general description of the services available is presented below, along with some cautionary notes.

Testing Services

The Branch provides machine scoring and statistical analysis of locally developed tests and of tests such as the Canadian Test of Basic Skills. These services, open to school boards, schools, and individual teachers, include:

- scoring of response sheets
- mean and variance of each test
- distribution table of scores
- item analysis
- individual student percentiles when norming done
- group achievement levels

Interested parties should consult the Branch about other services that may be provided.

The Branch issues local system norms only for national copyrighted standardized tests. Class, school, and school system norms can be obtained from the Branch for such tests, but not regional, provincial, or western Canadian norms as provision of these latter norms - if available - would infringe upon copyrights held by the parent companies for the tests. These companies have developed their own Canadian and western Canadian norms.

The Branch is a provider of data, not a consulting agency regarding interpretation of norms and items. Interpretations are the responsibility of the test initiator. Whether the test is developed locally, by the Branch, or nationally standardized, it is advisable to submit at least 100 student papers if norming is requested. Fewer numbers do not permit valid statistical analysis.

Keys for both locally developed and nationally standardized tests must be provided to the Branch by the user. In all cases the test answer sheets must be original IBM 1230 mark sense sheets, which should be ordered from the School Book Branch so that there will be no possibility of error. The IBM 1230 optical scanner used for scoring reads only original 1230 mark sense sheets, not photocopies.

Research Requests

Besides aid to other branches of Alberta Education for provincial educational research and data processing, the Branch provides item sorts for research when requested by The Alberta Teachers' Association, The Alberta School Trustees' Association, school boards, schools, teachers, and researchers. The services to date are without charge on a request basis when time and resources permit, and where the Branch deems the project of sufficient educational benefit to warrant assistance. It must be stressed that the Branch approves research requests on a time available basis and weighs Branch costs versus probable research benefits.

The research initiator must provide the program or the specifications for the program. The Branch does the sort and scoring, but the researcher must make the interpretations. Again, IBM 1230 mark sense sheets should be used because other formats require costly keypunching and cause time delays.

It is essential that the branch be contacted at the earliest possible stage of the research project so that discussion of format, extent, and processing of the project occurs at the earliest and simplest point for avoiding difficulties in programming.

All persons interested in any of the services mentioned above should consult with the Branch before submitting data or project specifications. Interested parties should also consult the handbook, "Services for Scoring and Analysis of School Testing Projects" for explanations of statistical terms and procedures, preparation and shipping instructions, and use of proper forms. A check of the handbook, however, will not eliminate the necessity of contact with the Branch prior to conducting a testing or research project for Branch scoring and analysis.

Note on References

The main references for most of this report are the Director and staff of the Student Evaluation and Data Processing Branch, Alberta Education. A number of papers prepared for in-house use by staff of Alberta Education also proved helpful. Following is a list of published sources found useful in preparing the report.

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